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XXXIII. *Remarks on the Changes of the Plumage of Birds.* By the Rev. William Whitear, of Starston in Norfolk. Communicated by Joseph Sabine, Esq., F.R.S. and L.S., &c.

Read April 6, 1819.

IT is well known that birds annually change their feathers, and that in many of them the new feathers are of a different colour from those which were cast. It is also known, that several birds put on a different livery during the breeding season to that which they wear in autumn. But no writer, with whom I am acquainted, has hitherto pointed out the fact, that in some birds *the full-grown feathers themselves change colour without being replaced by new ones.* Some recent observations that I have made upon birds assuming their summer plumage give me reason to suppose that such a change does really take place.

In the year 1817, Mr. Youell of Yarmouth had sixteen young wild Mallards confined in a small pond by netting; and he was much surprised to find that towards the end of the year these birds put on a great deal of the beautiful plumage of the old bird, and yet that no feathers were to be found floating on the water, or scattered on the banks of the pond, as is usually the case when birds are moulting. Mr. Youell having made the same remark last year upon other birds of the duck genus, and communicated his suspicions to me, that birds sometimes change the colour of their dress without shooting their feathers, I determined

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to make such observations upon them as might tend either to establish or disprove the fact.

On the 9th of January last I received a young wild Mallard, which had nearly assumed the plumage of the adult bird. Upon examining the feathers of this bird, I found many of them which were party-coloured, the same individual feather retaining in some parts the colours of the bird during its first months, and in other parts exhibiting those of the perfect bird. A male Chaffinch, killed in February, had the feathers on the crown of the head blueish ash-colour, except at their extremities, which were rufous-brown, apparently still retaining on those parts the colour of the young bird, while the greater part of each feather had assumed that of the old one. Three specimens of the Swiss Sandpiper, in a state of change from the winter to the summer garb, had many feathers upon the breast and belly perfectly black, others perfectly white, and the rest sprinkled with black and white in various degrees; in some the black just beginning to appear, in others only a little white remaining upon them. A white-fronted goose, killed in October, had the breast, belly and sides, white blotched irregularly with black. The feathers upon those parts exhibited exactly the same varied appearance as those of the Swiss Sandpipers. A Dunlin, in a state of change from winter to summer plumage, presented a similar mixture of black and white in the feathers on the belly; but in this bird the black did not predominate so much as in the foregoing. In a young specimen of the black-headed Gull, killed the 9th of March, the scapulars were of a mixed colour, the same feather retaining some of the brown of the imperfect bird, together with the light blue ash-colour of the adult state. And the two colours prevailed in various degrees, some feathers exhibiting only the nascent shades of the ash-colour, and in others the remains alone of the

brown were discoverable. The wing-coverts were in a similar state of change. Many of the feathers on the head of a Reed-Bunting (killed the same day as the gull) were black with reddish-brown tips, the extremity of each feather apparently retaining the winter tint, while the greater part of it had assumed that of the summer.

The above observations seem pretty strongly to confirm the fact which Mr. Youell has pointed out, namely, that a change in the colour of the plumage of birds does not always arise from a change of feathers, but sometimes proceeds from the feathers themselves assuming at one season of the year a different colour from that which they have at another. This fact may be fully tried upon living birds. If the feathers of a live bird, apparently beginning to change, were marked by fastening a piece of silk to them, notching them, or otherwise, and it was observed that the first colour of the feather gradually disappeared, while the new colour extended itself more and more, till the feather had assumed that exhibited by the perfect bird, the fact would be established beyond contradiction.

Having called the attention of ornithologists to this subject, I hope it will be pursued by those who have better opportunities of investigating it than myself. An inquiry into the changes which the feathered race undergo, can hardly fail of throwing light upon the history of this beautiful and interesting part of the creation.

March 18, 1819.